

WHAT IS CLAIMED IS:

1. An optical semiconductor device having an active layer, said device comprising a plurality of semiconductor layers including an n-p junction between an n-type layer and a p-type layer, said active layer emitting light when holes and electrons recombine therein, said active layer having a polarization field therein having a field direction that depends on the orientation of said active layer when said active layer is grown, wherein said active layer has an orientation such that said polarization field is directed from said n-layer to said p-layer.

2. The optical semiconductor device of Claim 1 wherein one of said semiconductor layers comprises GaN.

3. The optical semiconductor device of Claim 1 wherein said plurality of semiconductor layers includes a reverse bias tunnel diode.

4. The optical semiconductor device of Claim 1 wherein said semiconductor layers are grown on an n-type GaN base layer having a reversed c-axis

5. The optical semiconductor device of Claim 4 wherein said base layer comprises a GaN layer grown by molecular beam epitaxial deposition.

6. The optical semiconductor device of Claim 1 wherein said semiconductor layers are grown on a substrate having a planar surface and wherein said active layer comprises a layer tilted at an angle with respect to said substrate.

7. In a method for fabricating a semiconductor light emitting device comprising a plurality of semiconductor layers including an active layer between an n-type layer and a p-type layer, said active layer generating light by the recombination of holes and electrons, said active layer having a polarization field therein with a field direction that depends on the orientation of said active layer when said active layer is grown, the improvement comprising growing one of said plurality of semiconductor layers on a base layer such that said polarization field is directed from said n-layer to said p-layer.

8. The method of Claim 7 wherein one of said semiconductor layers comprises GaN.

AI 5 9. The method of Claim 7 wherein said base layer is generated by growing a GaN seed layer having a top and bottom surface, said bottom surface being in contact with a substrate that causes said GaN layer to have a crystal orientation in the wurtzite c-axis direction; removing said seed layer from said substrate; and growing said base layer on said bottom surface of said seed layer.

10 10. The method of Claim 9 wherein said base layer is grown by molecular beam epitaxial growth.

11. The method of Claim 7 wherein said substrate has a planar surface on which said layers are grown and wherein said active layer is grown on a surface that is tilted at an angle with respect to said substrate.

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